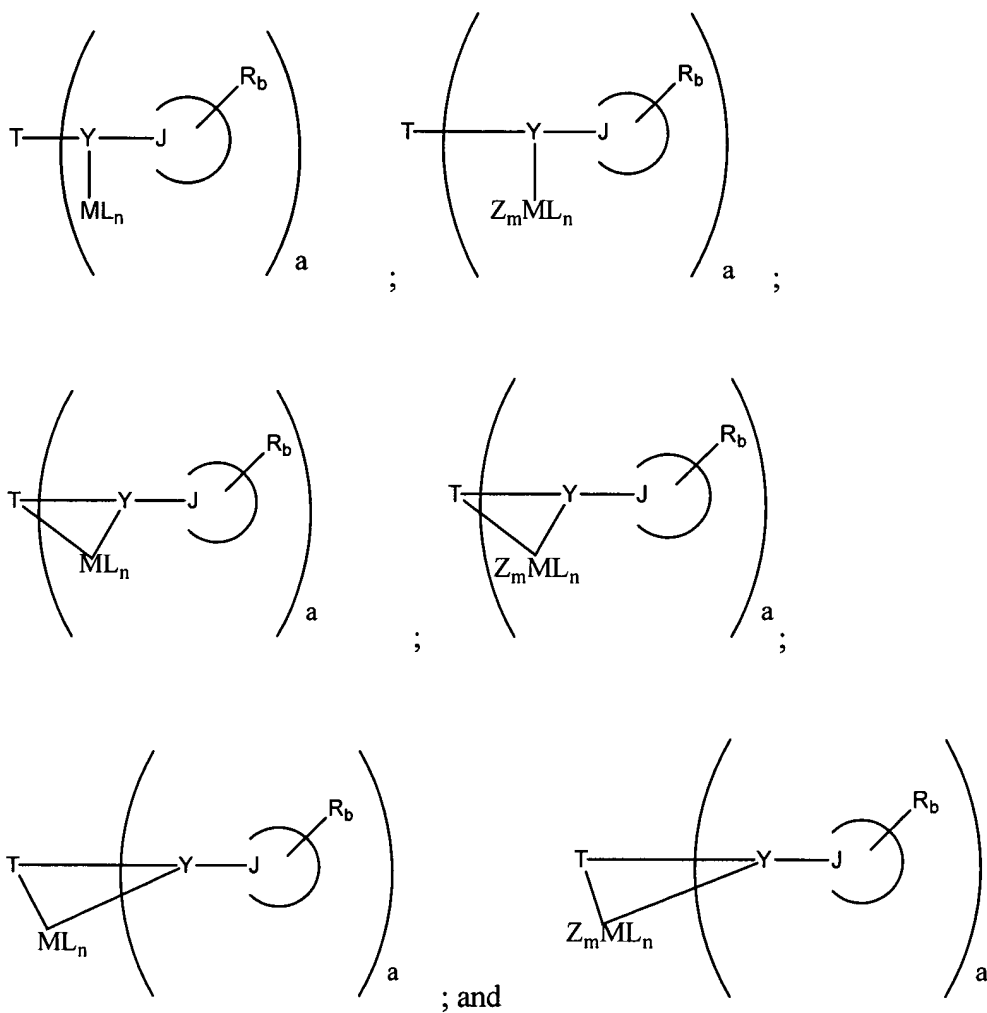


# Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

## Listing of Claims:

1. (Currently amended) A catalyst precursor represented by one of the formula selected from:



where a is an integer from 1 to 5;

T is a chemical moiety having 1 to 100 atoms, which can include hydrogen when a is equal to 1, and is a bridging group that bridges the Y atoms when a is equal to 2 to 5;

M is a metallic element selected from Groups ~~1 to 15~~, ~~and the Lanthanide~~ 3 to 7 series of the Periodic Table of the Elements;

Z is a coordination ligand;

~~m is an integer from 1 to 3;~~

each L is a monovalent, bivalent, or trivalent anionic ligand;

n is an integer from 1 to 6;

m is an integer from 0 to 5;

~~Y is a heteroatom selected from nitrogen, oxygen, sulfur, and phosphorus;~~

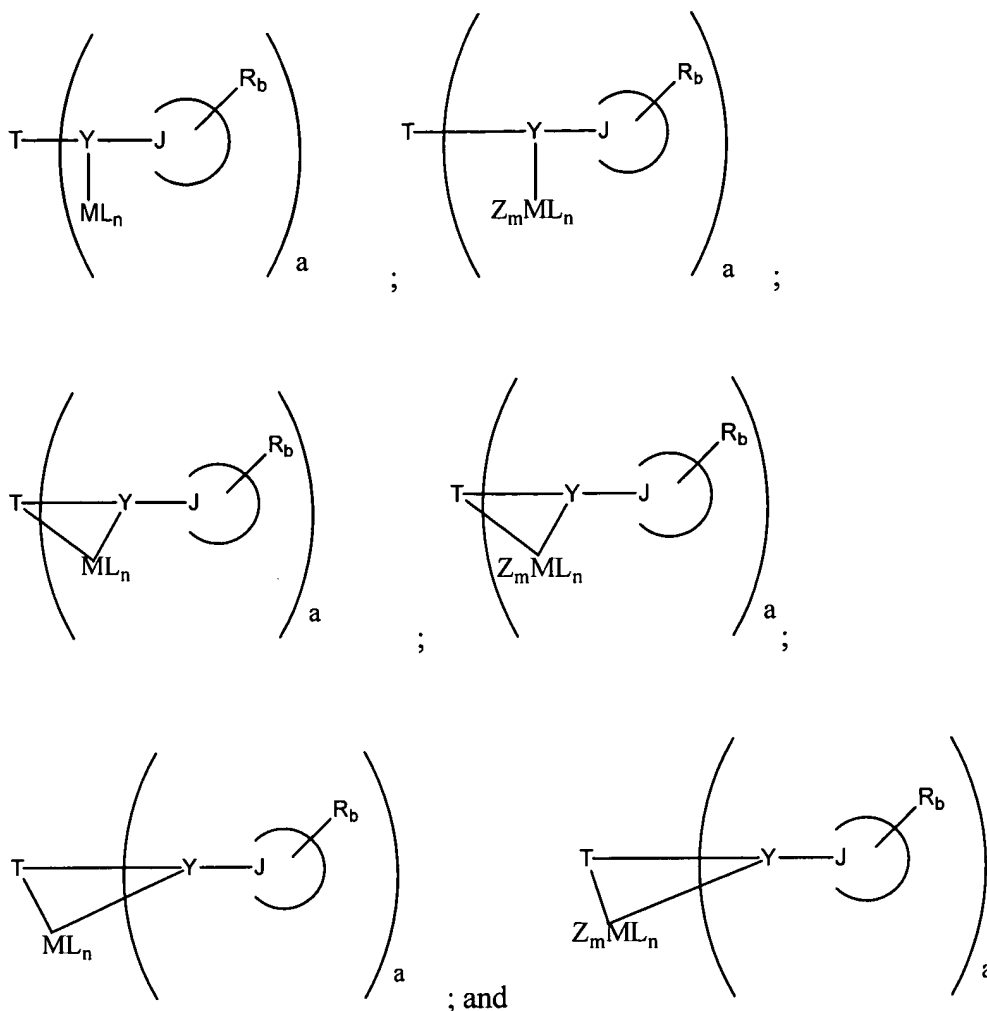
J is a heteroatom that is part of a ring structure and is ~~selected from~~ nitrogen, ~~oxygen, sulfur, and phosphorus;~~ wherein the ring to which J is part of is a five or six member ring;

R can be independently hydrogen, or a non-bulky or a bulky substituent; and

b is an integer from 0 to 20.

2. (Currently amended) The catalyst precursor of claim 1 wherein Z is selected from at least one of triphenylphosphine, tris(C<sub>1</sub>-C<sub>6</sub> alkyl) phosphine, tricycloalkyl phosphine, diphenyl alkyl phosphine, dialkyl phenyl phosphine, trialkylamine, arylamine, a substituted or unsubstituted C<sub>2</sub> to C<sub>20</sub> alkene, an ester group, a C<sub>1</sub> to C<sub>4</sub> alkoxy group, an amine group, carboxylic acid, and di(C<sub>1</sub> to C<sub>3</sub>) alkyl ether, an  $\eta^4$  diene, tetrahydrofuran, and a nitrile.
3. (Original) The catalyst precursor of claim 1 wherein each L is an anionic ligand independently selected from those containing from about 1 to 50 non-hydrogen atoms and selected from the group comprised of halogen containing groups; hydrogen; alkyl; aryl; alkenyl; alkylaryl; arylalkyl; hydrocarboxy; amides, phosphides; sulfides; silyalkyls; diketones; borohydrides; and carboxylantes.

4. (Original) The catalyst precursor of claim 3 wherein each L is an anionic ligand independently selected from those containing from about 1 to 20 non-hydrogen atoms and selected from the alkyl, arylalkyl, and halogen containing groups.
5. (Cancelled).
6. (Original) The catalyst precursor of claim 5 wherein M is selected from Hf and Zr.
7. (Original) The catalyst precursor of claim 1 wherein n is an integer from 1 to 4.
8. (Cancelled).
9. (Original) The catalyst precursor of claim 1 wherein R is a non-bulky substituent selected from straight and branched chain alkyl groups.
10. (Original) The catalyst precursor of claim 9 wherein R is a C<sub>1</sub> to C<sub>10</sub> straight chain alkyl group.
11. (Original) The catalyst precursor of claim 1 wherein R is a bulky substituent containing from about 3 to 50 non-hydrogen atoms and be selected from alkyl, alkenyl, cycloalkyl, heterocyclic (both heteroalkyl and heteroaryl), alkylaryl, arylalkyl, polymeric, and inorganic ring moieties.
12. (Original) The catalyst precursor of claim 11 wherein R contains from about 4 to 20 non-hydrogen atoms.
13. (Cancelled)
14. (Currently amended) A catalyst composition comprised of:
  - a) a catalyst precursor represented by one of the formulae selected from:



where a is an integer from 1 to 5;

T is a chemical moiety having 1 to 100 atoms, which can include hydrogen when a is equal to 1, and is a bridging group that bridges the Y atoms when a is equal to 2 to 5;

M is a metallic element selected from Groups ~~1 to 15~~, ~~and the Lanthanide~~ 3 to 7 series of the Periodic Table of the Elements;

Z is a coordination ligand;

~~m is an integer from 1 to 3;~~

each L is a monovalent, bivalent, or trivalent anionic ligand;

n is an integer from 1 to 6;

m is an integer from 0 to 5;

Y is ~~a heteroatom selected from nitrogen, oxygen, sulfur, and phosphorus;~~

J is a heteroatom that is part of a ring structure and is ~~selected from nitrogen, oxygen, sulfur, and phosphorus;~~ wherein the ring to which J is part of is a five or six member ring;

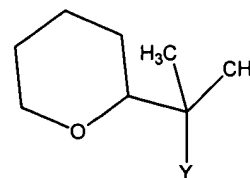
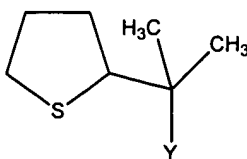
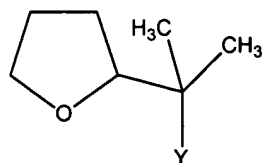
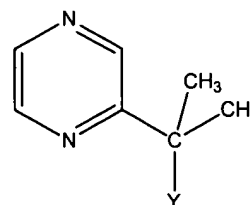
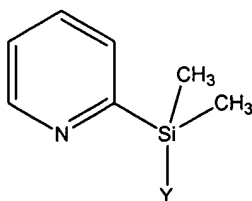
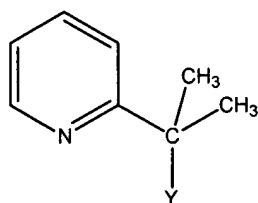
R can be independently hydrogen, or a non-bulky or a bulky substituent; and

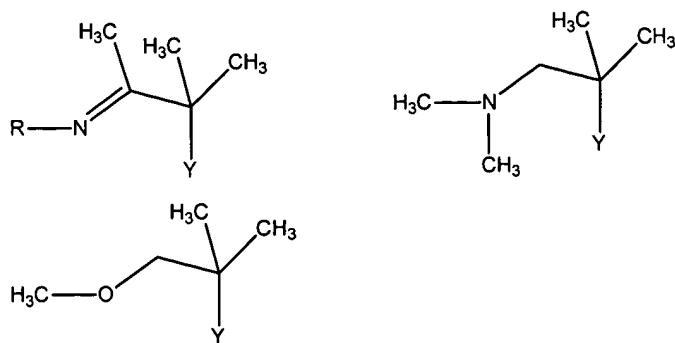
b is an integer from 0 to 20; and

b) an activating cocatalyst.

15. (Currently amended) The catalyst composition of claim 14 wherein Z is selected from at least one of triphenylphosphine, tris(C<sub>1</sub>-C<sub>6</sub> alkyl) phosphine, tricycloalkyl phosphine, diphenyl alkyl phosphine, dialkyl phenyl phosphine, trialkylamine, arylamine, a substituted or unsubstituted C<sub>2</sub> to C<sub>20</sub> alkene, an ester group, a C<sub>1</sub> to C<sub>4</sub> alkoxy group, an amine group, carboxylic acid, and di(C<sub>1</sub> to C<sub>3</sub>) alkyl ether, an  $\eta^4$  diene, tetrahydrofuran, and a nitrile.
16. (Original) The catalyst composition of claim 14 wherein each L is an anionic ligand independently selected from those containing from about 1 to 50 non-hydrogen atoms and selected from the group comprised of halogen containing groups; hydrogen; alkyl; aryl; alkenyl; alkylaryl; arylalkyl; hydrocarboxy; amides, phosphides; sulfides; silyalkyls; diketones; borohydrides; and carboxylantes.
17. (Original) The catalyst composition of claim 16 wherein each L is an anionic ligand independently selected from those containing from about 1 to 20 non-hydrogen atoms and selected from the alkyl, arylalkyl, and halogen containing groups.
18. (Cancelled).
19. (Original) The catalyst composition of claim 18 wherein M is selected from Hf and Zr.
20. (Original) The catalyst composition of claim 14 wherein n is an integer from 1 to 4.

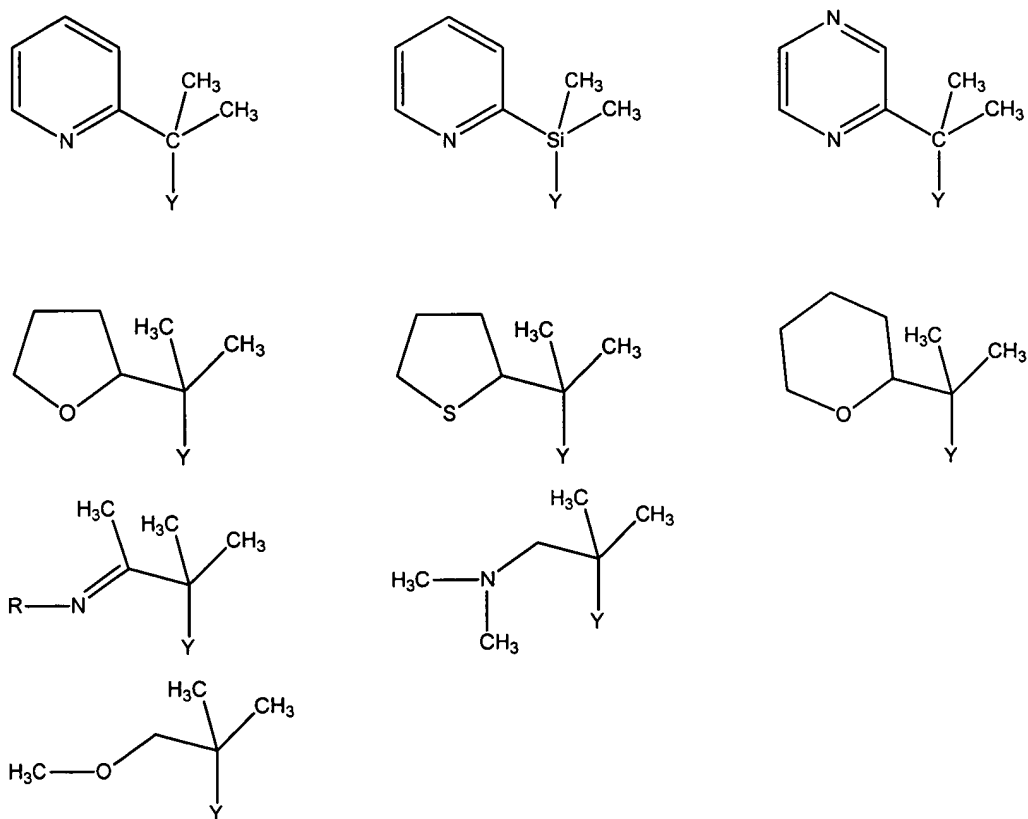
21. (Cancelled).
22. (Original) The catalyst composition of claim 14 wherein R is a non-bulky substituent selected from straight and branched chain alkyl groups.
23. (Original) The catalyst composition of claim 22 wherein R is a C<sub>1</sub> to C<sub>10</sub> straight chain alkyl group.
24. (Original) The catalyst composition of claim 14 wherein R is a bulky substituent containing from about 3 to 50 non-hydrogen atoms and be selected from alkyl, alkenyl, cycloalkyl, heterocyclic (both heteroalkyl and heteroaryl), alkylaryl, arylalkyl, polymeric, and inorganic ring moieties.
25. (Original) The catalyst composition of claim 14 wherein R contains from about 4 to 20 non-hydrogen atoms.
26. (Cancelled)
27. (New) The catalyst precursor of Claim 1, wherein a is 1 and T is selected from:





wherein Y is shown for convenience.

28. (New) The catalyst composition of Claim 14, wherein a is 1 and T is selected from:



wherein Y is shown for convenience.